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Preprint from the 1987

BUREAU OF MINES MINERALS YEARBOOK

The Mineral Industry of Switzerland

UNITED STATES DEPARTMENT OF THE INTERIOR

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This publication is a chapter from the current Bureau of Mines Minerals Yearbook, comprising *Volume I, Metals and Minerals; Volume II, Area Reports: Domestic; Volume III, Area Reports: International.* The separate volumes of the Yearbook are sold by the Superintendent of Documents, Washington, D.C. 20402.

The Mineral Industry of Switzerland

By Richard M. Levine[1]

In Switzerland, despite its rugged topography with abundant outcrops and plentiful small occurrences of minerals, exploration had not confirmed abundant economic mineral reserves. Switzerland had only a very small mining industry that exploited a few industrial minerals. All energy fuels were imported, except for about 1.1 billion cubic feet of natural gas produced at Fensterwald in Lucerne Canton. However, hydroelectric power was significant as an indigenous source of electric power. In the metallurgical sector, aluminum was the only metal produced in appreciable quantities.

In 1987, the Swiss economy continued its satisfactory course with the gross domestic product (GDP) growing at a rate of 2.5%. Major economic issues that Switzerland faced included coping with the growing coordination of economic ties with the countries of the European Communities (EC), of which Switzerland was not a member, and deciding whether to proceed with nuclear power development. Economic growth was accompanied by investment in heavy capital goods purchases and by a strong revival of the construction industry.

PRODUCTION

All mineral industries were privately owned except for the salt industry, which was a Government monopoly. Metallurgical products were produced entirely from imported raw materials. Although aluminum was the only metal produced in appreciable quantities, the country also produced small amounts of gallium, iron and steel products, and secondary lead. Switzerland refined its own petroleum products but relied entirely on imported crude stocks. The country also produced a small number of industrial minerals, including cement, gypsum, lime, nitrogen, salt, and sodium compounds.

Table 1.—Switzerland: Production of mineral commodities[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]	1983	1984	1985	1986[p]	1987[e]
METALS					
Aluminum, smelter, primary metric tons	75,974	79,173	72,742	80,249	[3]73,169
Iron and steel:					
Pig iron and blast furnace ferroalloys	10	54	66	79	80
Electric-furnace ferroalloys[e]	4	5	5	5	5
Steel, crude	835	978	987	1,075	1,100
Semimanufactures, rolled products	780	800	950	980	900
Lead, refined, secondary metric tons	2,000	2,000	2,000	2,500	2,500
INDUSTRIAL MINERALS					
Cement, hydraulic	4,138	4,181	4,254	4,393	[3]4,617
Gypsum[e]	186	220	220	200	230
Lime	42	41	37	35	40
Nitrogen: N content of ammonia	[r]35	[r]33	31	30	39
Salt	317	372	374	389	390
Sodium compounds, n.e.s.: Carbonate[e] metric tons	45	44	45	43	23
Sulfur, byproduct, all sources do	2,711	2,878	2,638	3,201	5,533
MINERAL FUELS AND RELATED MATERIALS					
Gas:					
Manufactured million cubic feet	1,131	1,098	1,154	1,162	1,170
Natural do	--	--	700	600	1,100
Petroleum refinery products:					
Refinery gas thousand 42-gallon barrels	948	849	920	984	1,070
Liquefied petroleum gas do	[r]1,636	[r]1,647	1,717	1,670	[3]1,817
Gasoline, all kinds do	[r]9,343	[r]8,407	8,486	8,723	[3]8,765
Naphtha do	162	77	77	153	160
Jet fuel do	[r]2,044	[r]2,052	1,922	2,099	[3]2,286
Kerosene do	37	[r]25	32	31	[3]30
Distillate fuel oil do	[r]13,243	[r]13,184	13,494	13,622	[3]12,562
Residual fuel oil do	[r]4,927	[r]5,081	4,746	4,824	[3]4,117
Bitumen do	689	844	695	926	[3]933
Total do	[r]32,867	[r]32,089	32,012	32,789	31,880

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Table includes data available through Nov. 30, 1988.

[2]In addition to the commodities listed, a variety of crude construction materials (common clay, sand and gravel, and stone) is undoubtedly produced, but output is not reported, and available general information is inadequate to make reliable estimates of output levels.

[3]Reported figure.

TRADE

Reflecting its lack of natural resources, Switzerland usually ran a merchandise-trade deficit that was more than compensated for by earnings on capital and services, which in total yielded a positive current account balance. In 1987, Switzerland was able to achieve an increase in exports despite the appreciation of the Swiss franc.[3] However, the trade balance was less favorable than in 1986 as imports increased more than exports. Switzerland ranked as the seventh-largest European trading partner of the United States, ranking behind Italy but ahead of Spain. Precious stones and jewelry were one of the main Swiss imports from the United States, and jewelry was one of the main Swiss exports to the United States. The United States placed Switzerland in a more favorable status as a recipient of items on the U.S. export control list, which eased the granting of U.S. export licenses.

Government Policies and Programs.—In 1987, the third stage of a phase-in of emission standards for automobiles was implemented, bringing emission standards to the levels of the United States 1983 standards. These new standards would implicitly necessitate catalytic converters. Also during the year, Switzerland and the EC reached a basic agreement on scientific and technological cooperation for research and development in advanced materials in an effort to coordinate the EC program with the Swiss research program "Materials for the Needs of Tomorrow."

Despite projected increases in electricity demand in the coming decades, two popular initiatives to amend the Constitution were advanced opposing nuclear power development. One would impose a 10-year moratorium on construction of new nuclear powerplants, and the other called for a complete phaseout of nuclear power. These two national referenda were to be voted upon in 1990-91. Recent opposition to nuclear power development had been fueled by the accident at the reactor in Chernobyl in

the U.S.S.R.

Switzerland already had five nuclear powerplants in operation that supplied almost 40% of the country's electric power output with this percentage rising in winter. Nuclear power had tripled its share of energy generation in the past 15 years. During the year, a study was being conducted by a group of experts commissioned by the Swiss Federal Energy Office to determine the prerequisites, possibilities, and consequences of phasing out the use of nuclear energy in Switzerland. Results of this study were to be released in 1988.

Owing to the increased opposition to the development of nuclear power in the country, plans for the construction of the nuclear powerplant at Kaiseraugst near Basel, over which a 20-year battle had been waged, were in serious jeopardy of being canceled.

Table 2.—Switzerland: Exports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986: United States	Destinations, 1986: Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals kilograms	2,604	2,358	64	West Germany 638.
Alkaline-earth metals do	98	35	—	NA.
Aluminum:				
Ore and concentrate	10	14	NA	NA.
Oxides and hydroxides	1,445	423	36	West Germany 215.
Metal including alloys:				
Unwrought including scrap	49,570	54,582	32	West Germany 32,756; Italy 16,028.
Semimanufactures	101,668	104,870	2,806	West Germany 23,646; France 17,436.
Antimony: Metal including alloys, all forms kilograms	172	1,292	NA	NA.
Arsenic: Oxides and acids do	148	103	NA	NA.
Beryllium: Metal including alloys, all forms do	159	164	14	NA.
Chromium: Oxides and hydroxides	75	28	(2)	West Germany 19; Italy 3.
Cobalt: Oxides and hydroxides: kilograms	205	363	—	NA.
Columbium and tantalum: Metal including alloys, all forms, tantalum do	794	550	25	West Germany 161; United Kingdom 161.
Copper:				
Ore and concentrate	(2)	—	—	
Matte and speiss including cement copper	2,593	60	(2)	Italy 26; West Germany 24.
Sulfate	25	12	NA	West Germany 4.
Metal including alloys:				
Scrap	13,268	12,244	98	West Germany 5,814; Austria 2,190; Italy 1,299.
Unwrought	5,790	5,310	—	West Germany 3,699; Italy 1,467.
Semimanufactures	25,730	26,776	3,973	West Germany 9,972; France 3,215.
Gold: Metal including alloys, unwrought and partly wrought thousand troy ounces	29,897	29,640	NA	NA.
Iron and steel:				
Iron ore and concentrate: Pyrite, roasted	28	29	—	France 8; Peru 8; Philippines 6.
Metal:				
Scrap	100,135	60,949	—	Italy 39,668; West Germany 15,744.
Pig iron, cast iron, related materials	829	1,030	27	West Germany 848.
Ferroalloys:				
Ferroaluminum	2	2	—	All to West Germany.
Ferrosilicon	115	133	—	West Germany 65.
Silicon metal	6,445	6,195	34	West Germany 5,665; Austria 240; Italy 202.
Unspecified	199	156	1	West Germany 34.
Steel, primary forms	6,721	26,152	—	Italy 23,530; France 2,126.
Semimanufactures:				
Bars, rods, angles, shapes, sections	535,213	505,438	588	West Germany 277,860; Italy 115,783; France 46,774.
Universals, plates, sheets	96,012	110,852	1,235	West Germany 82,724; Austria 7,906; Italy 5,945.

See footnotes at end of table.

Table 2.—Switzerland: Exports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986: United States	Destinations, 1986: Other (principal)
METALS —Continued				
Iron and steel —Continued				
Metal —Continued				
Semimanufactures —Continued				
Hoop and strip	35,196	46,129	53	Austria 19,585; West Germany 16,365; France 7,272.
Rails and accessories	3,354	2,180	18	Italy 837; Austria 647; West Germany 358.
Wire	25,369	26,863	2,448	West Germany 14,327; France 4,308.
Tubes, pipes, fittings	210,029	189,610	9,240	West Germany 77,352; Denmark 17,579.
Castings and forgings, rough	10,269	11,148	424	West Germany 4,520; France 3,040.
Lead:				
Oxides	5	128	--	U.S.S.R. 120; Uganda 4; Austria 2.
Metal including alloys:				
Scrap	10,391	16,008	--	Italy 9,327.
Unwrought	4,983	2,068	--	Italy 1,521.
Semimanufactures	44	13	(2)	West Germany 6; Austria 3.
Magnesium: Metal including alloys:				
Unwrought including scrap	202	116	--	West Germany 96.
Semimanufactures	584	649	28	France 188; Belgium-Luxembourg 75.
Manganese: Oxides	146	4	--	Greece 3.
Mercury, 76-pound flasks	854	151	(2)	Netherlands 58; Bulgaria 29; West Germany 29.
Molybdenum: Metal including alloys, all forms	12	6	(2)	West Germany 2; Brazil 1.
Nickel: Metal including alloys:				
Scrap	256	295	--	West Germany 276; France 19.
Unwrought	105	44	(2)	West Germany 43.
Semimanufactures	563	546	2	France 219; West Germany 138; Italy 63.
Platinum-group metals: Metals including alloys, unwrought and partly wrought, thousand troy ounces	999	915	21	Japan 304; West Germany 166.
Rare-earth metals including alloys, all forms, kilograms	72	751	--	Japan 250.
Silver:				
Waste and sweepings[3], value, thousands	$154,916	$67,878	$7	West Germany $28,166; Spain $23,978.
Metal including alloys, unwrought and partly wrought, thousand troy ounces	17,485	22,107	37	United Kingdom 933.
Tin: Metal including alloys:				
Scrap	90	28	--	West Germany 13.
Unwrought	198	161	(2)	Italy 70; West Germany 66.
Semimanufactures	24	59	--	Iran 54; Italy 8.
Titanium: Oxides	397	139	(2)	Austria 50; Italy 49.
Tungsten: Metal including alloys, all forms	63	38	(2)	West Germany 31.
Uranium and thorium: Oxides and other compounds	7	5	(2)	West Germany 2.
Zinc:				
Oxides	22	18	--	Italy 12; Yugoslavia 3; France 2.
Blue powder	25	34	NA	Austria 15; Hungary 10.
Metal including alloys:				
Scrap	1,182	1,222	--	Italy 750; West Germany 389.
Unwrought	137	27	--	West Germany 19; Italy 5; France 2.
Semimanufactures	79	11	--	France 3; West Germany 2.
Other:				
Ores and concentrates	165	178	(2)	Portugal 65; West Germany 32; Italy 25.
Ashes and residues	15,485	16,518	38	West Germany 6,350; Belgium-Luxembourg 4,966; Italy 2,066.
Base metals including alloys, all forms	502	978	62	West Germany 109.
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	28	25	(2)	West Germany 7; France 1.
Artificial:				
Corundum	271	220	17	West Germany 131.
Silicon carbide	5,504	5,622	NA	NA.

See footnotes at end of table.

Table 2.—Switzerland: Exports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS —Continued				
Abrasives, n.e.s. —Continued				
Dust and powder of precious and semiprecious stones including diamond kilograms	3,369	3,674	198	Italy 1,502; France 402; West Germany 380.
Grinding and polishing wheels and stones	1,912	1,830	42	West Germany 453; United Kingdom 427.
Asbestos, crude	5	15	(2)	Austria 7; West Germany 5.
Barite and witherite	38	15	1	Ivory Coast 5; West Germany 4; Austria 3.
Boron materials:				
Crude natural borates	5	3		All to West Germany.
Oxides and acids	5	2		NA.
Cement	16,575	25,288	54	West Germany 23,392; France 1,695.
Chalk	280	284	20	West Germany 184; France 26; Austria 15.
Clays, crude	50,513	73,080	(2)	West Germany 72,775; Austria 145.
Cryolite and chiolite	46	5		Brazil 2; Turkey 1; Venezuela 1.
Diamond:				
Gem, not set or strung value, thousands	$1,092,872	$1,324,543	$62,731	United Kingdom $746,443; Israel $249,461.
Industrial stones do	$39,771	$45,856	$1,364	Italy $21,212; France $4,157; West Germany $3,519.
Diatomite and other infusorial earth	40	50	(2)	Yugoslavia 24; Greece 8; West Germany 4.
Feldspar, fluorspar, related materials	159	153		Portugal 41; West Germany 39; Venezuela 24.
Fertilizer materials:				
Crude, n.e.s.	2,210	1,871		Austria 1,245; France 543.
Manufactured:				
Ammonia	31	11		France 6; West Germany 2; Republic of Korea 1.
Nitrogenous	1,953	1,346	2	West Germany 1,220; Sweden 80.
Phosphatic	2	4	NA	NA.
Unspecified and mixed	3,535	4,284	14	West Germany 2,104; Peru 612.
Graphite, natural	10	8		West Germany 2; Republic of Korea 2; Peru 1.
Gypsum and plaster	11,970	15,143	1	France 14,014.
Lime	787	768		Norway 322; West Germany 203; Denmark 175.
Magnesium compounds: Oxides and hydroxides	16	75	(2)	West Germany 20; France 6.
Mica:				
Crude including splittings and waste	130	77		West Germany 57; Venezuela 8; Austria 5.
Worked including agglomerated splittings	447	490	1	Sweden 63; United Kingdom 51; Norway 50.
Phosphates, crude kilograms		84		All to West Germany.
Phosphorus, elemental do	222	791	NA	West Germany 44; unspecified 747.
Pigments, mineral:				
Natural, crude	29	28	NA	NA.
Iron oxides and hydroxides, processed	78	405	1	West Germany 353; Philippines 15.
Potassium salts, crude	103	117	NA	NA.
Precious and semiprecious stones other than diamond:				
Natural value, thousands	$168,344	$193,226	$31,966	France $36,098; Hong Kong $23,136.
Synthetic do	$20,003	$27,763	$4,507	West Germany $4,825; France $2,651.
Pyrite, unroasted	16,853			
Salt and brine	49	45	(2)	Argentina 9; Bangladesh 9; Belgium-Luxembourg 6.
Sodium compounds, n.e.s.:				
Carbonate, manufactured	22,532	15,739	NA	Italy 10,253; West Germany 5,186.
Sulfate, manufactured	178	46	NA	Austria 15.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	21,978	27,153	(2)	West Germany 12,757; Italy 12,692.
Worked	8,319	7,593	8	West Germany 6,710; Austria 404.
Dolomite, chiefly refractory-grade	38	24		West Germany 18; Philippines 5.

See footnotes at end of table.

Table 2.—Switzerland: Exports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Destinations, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS —Continued				
Stone, sand and gravel —Continued				
Gravel and crushed rock	8,972	43,853	1	West Germany 41,716; France 963.
Limestone other than dimension	25	80	--	France 78.
Quartz and quartzite	30,777	36,069	1	Italy 35,217; West Germany 607.
Sand other than metal-bearing	16,837	18,955	(2)	Italy 14,971; France 2,975.
Sulfur:				
Elemental:				
Crude including native and by-product	4,634	6,421	--	Italy 3,570; Yugoslavia 1,483; West Germany 1,276.
Colloidal, precipitated, sublimed	27	43	--	West Germany 42.
Dioxide	9	15	--	NA.
Sulfuric acid	20,209	18,438	(2)	West Germany 15,754; France 1,216.
Talc, steatite, soapstone, pyrophyllite	95	86	(2)	Austria 48; France 10; West Germany 8.
Other:				
Crude	3,917	1,762	(2)	West Germany 1,309; Belgium-Luxembourg 74.
Slag and dross, not metal-bearing	36,051	44,699	--	West Germany 32,355; Italy 11,496.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	3	34	--	France 32; West Germany 2.
Carbon black	253	183	(2)	Czechoslovakia 57; Austria 30; West Germany 24.
Coal:				
Anthracite and bituminous	2,204	1	NA	NA.
Briquets of anthracite and bituminous coal—kilograms	--	105	--	All to Brazil.
Coke and semicoke	257	1,686	--	West Germany 1,685.
Peat including briquets and litter	1,522	1,212	--	Austria 1,056; West Germany 156.
Petroleum:				
Crude—42-gallon barrels	7	43	--	U.S.S.R. 36.
Refinery products:				
Liquefied petroleum gas—do	489,694	330,600	1,427	Italy 283,933; France 33,489.
Gasoline—do	145,852	34,162	17	Austria 32,198; Netherlands 986.
Mineral jelly and wax—do	776	1,015	228	France 244; United Kingdom 228.
Kerosene and jet fuel—do	2,464	2,992	--	Austria 2,836; West Germany 85.
Distillate fuel oil—do	110,020	34,987	--	Austria 34,972.
Lubricants—do	126,084	104,972	6,573	Italy 24,724; West Germany 24,045.
Residual fuel oil—do	1,938,007	1,252,246	--	West Germany 1,134,012; Austria 99,787.
Bitumen and other residues—do	18	2,333	--	All to Austria.
Bituminous mixtures—do	11,684	12,447	1,097	West Germany 3,109; France 2,188.
Petroleum coke—do	390	412	33	West Germany 280; Italy 88.

NA Not available.
[1]Table prepared by Linda Williams.
[2]Less than 1/2 unit.
[3]May include other precious metals.

Table 3.—Switzerland: Imports of mineral commodities[1]

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
METALS				
Alkali and alkaline-earth metals:				
Alkali metals	519	392	1	West Germany 350; United Kingdom 30; France 10.
Alkaline-earth metals kilograms	519	1,357	251	NA.
Aluminum:				
Ore and concentrate	44	512	--	West Germany 132; United Kingdom 101.
Oxides and hydroxides	146,751	160,374	112	Australia 125,419; Italy 23,347.
Metal including alloys:				
Unwrought including scrap	78,745	88,274	67	West Germany 30,029; Norway 22,232; Iceland 21,406.
Semimanufactures	62,106	65,767	387	West Germany 29,572; Belgium-Luxembourg 10,680.
Antimony: Metal including alloys, all forms	27	62	NA	China 55.
Arsenic: Oxides and acids	31	1	--	NA.
Beryllium: Metal including alloys, all forms kilograms	1,019	3,532	2,663	United Kingdom 450; West Germany 419.
Chromium: Oxides and hydroxides	788	794	54	West Germany 571; Poland 79.
Cobalt: Oxides and hydroxides	2	15	1	West Germany 12; United Kingdom 1.
Columbium and tantalum: Metal including alloys, all forms, tantalum kilograms	1,457	2,024	1,007	Austria 830.
Copper:				
Ore and concentrate do	25	25	--	All from West Germany.
Matte and speiss including cement copper	11,637	13,707	167	Belgium-Luxembourg 5,812; West Germany 3,776; Chile 3,411.
Sulfate	802	738	--	Italy 260; U.S.S.R. 190; Czechoslovakia 90.
Metal including alloys:				
Scrap	6,845	6,263	428	West Germany 2,535; U.S.S.R. 1,678; Austria 525.
Unwrought	1,403	1,512	4	West Germany 1,035; United Kingdom 218.
Semimanufactures	89,100	89,848	395	West Germany 33,745; United Kingdom 16,950; France 11,894.
Gold: Metal including alloys, unwrought and partly wrought thousand troy ounces	28,392	38,420	NA	France 55; unspecified 38,286.
Iron and steel:				
Iron ore and concentrate: Pyrite, roasted	6,418	11,240	--	Belgium-Luxembourg 7,754; Norway 2,882; Italy 463.
Metal:				
Scrap	239,934	323,815	--	West Germany 195,443; France 105,107; Netherlands 17,453.
Pig iron, cast iron, related materials	70,402	50,976	3	West Germany 22,706, France 9,695; Brazil 9,509.
Ferroalloys:				
Ferroaluminum	301	377	--	United Kingdom 194; Belgium-Luxembourg 97.
Ferrosilicon	7,219	7,963	--	U.S.S.R. 2,319; West Germany 2,259; Yugoslavia 1,194.
Silicon metal	264	256	36	West Germany 123; France 72.
Unspecified	15,003	15,156	(2)	Norway 5,728; West Germany 3,620; France 3,199.
Steel, primary forms	208,572	164,303	77	West Germany 44,127; Netherlands 34,055; United Kingdom 31,933.
Semimanufactures:				
Bars, rods, angles, shapes, sections	638,396	660,236	603	Italy 183,288; West Germany 162,017; Belgium-Luxembourg 128,255.
Universals, plates, sheets	703,501	772,387	69	West Germany 201,932; Belgium-Luxembourg 126,504.
Hoop and strip	238,318	243,496	800	West Germany 131,730; Netherlands 36,438; Austria 27,670.
Rails and accessories	41,748	45,851	(2)	Austria 24,924; West Germany 14,291; Italy 5,374.
Wire	41,945	48,473	39	West Germany 15,349; Italy 12,897; Belgium-Luxembourg 4,823.
Tubes, pipes, fittings	153,737	152,483	109	West Germany 68,177; Italy 23,222; France 15,876.
Castings and forgings, rough	14,622	14,970	45	West Germany 5,132; East Germany 3,635; France 1,833.

See footnotes at end of table.

Table 3.—Switzerland: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986: United States	Sources, 1986: Other (principal)
METALS —Continued				
Lead:				
Ore and concentrate	3	12	12	
Oxides	265	402	--	West Germany 351; France 32; Netherlands 10.
Metal including alloys:				
Scrap	2	303	NA	Netherlands 286.
Unwrought	10,681	10,186	1,047	France 2,757; Canada 2,035; West Germany 1,701.
Semimanufactures	1,721	1,758	1	West Germany 1,533; Belgium-Luxembourg 187.
Magnesium: Metal including alloys:				
Unwrought including scrap	2,119	2,556	142	Norway 1,542; Italy 374; Canada 320.
Semimanufactures	56	41	3	West Germany 27; Italy 5.
Manganese: Oxides	1,118	1,434	(2)	Greece 894; Japan 298; Belgium-Luxembourg 101.
Mercury 76-pound flasks	1,705	1,084	(2)	Spain 565; United Kingdom 162.
Molybdenum: Metal including alloys, all forms	23	21	2	Austria 10; West Germany 5.
Nickel:				
Ore and concentrate	--	56	(2)	U.S.S.R. 24; Norway 21; United Kingdom 11.
Metal including alloys:				
Scrap	86	29	(2)	West Germany 14; Ivory Coast 5; Bulgaria 4.
Unwrought including matte and speiss	1,261	1,382	25	Republic of South Africa 297; Norway 242; Finland 225.
Semimanufactures	1,565	1,524	78	West Germany 914; United Kingdom 254.
Platinum-group metals: Metals including alloys, unwrought and partly wrought thousand troy ounces	1,198	1,158	112	United Kingdom 420; U.S.S.R. 158; West Germany 149.
Rare-earth metals including alloys, all forms kilograms	4,778	611	133	France 158.
Silver:				
Waste and sweepings[3] value, thousands	$67,655	$47,036	$1,537	Saudi Arabia $5,661; Lebanon $5,487; West Germany $4,762.
Metal including alloys, unwrought and partly wrought thousand troy ounces	29,047	56,225	22	Peru 808; West Germany 112; unspecified 52,997.
Tin:				
Ore and concentrate kilograms	235	--	--	
Metal including alloys:				
Scrap	7	5	--	Mainly from West Germany.
Unwrought	977	1,369	20	Malaysia 616; Indonesia 125; Netherlands 123.
Semimanufactures	407	432	2	West Germany 268; Belgium-Luxembourg 67; Netherlands 63.
Titanium: Oxides	2,348	1,693	(2)	West Germany 738; Belgium-Luxembourg 223; United Kingdom 302.
Tungsten: Metal including alloys, all forms	98	64	8	France 20; West Germany 18.
Uranium and thorium: Oxides and other compounds	16	18	1	France 11; West Germany 3.
Zinc:				
Ore and concentrate	4	4	--	All from West Germany.
Oxides	1,432	1,221	(2)	France 517; West Germany 290; United Kingdom 211.
Blue powder	3,352	3,500	--	Belgium-Luxembourg 1,890; West Germany 1,030.
Metal including alloys:				
Scrap	24	141	NA	Belgium-Luxembourg 49; Italy 33.
Unwrought	26,363	30,186	1	Netherlands 7,856; West Germany 6,562; Norway 5,191.
Semimanufactures	1,536	1,640	21	West Germany 757; France 277; Belgium-Luxembourg 264.
Other:				
Ores and concentrates	4,442	3,459	306	West Germany 900; Belgium-Luxembourg 853; Republic of South Africa 448.
Ashes and residues	807	1,172	1	West Germany 906; Austria 152.
Base metals including alloys, all forms	1,204	1,361	230	Republic of South Africa 234; Belgium-Luxembourg 230.

See footnotes at end of table.

Table 3.—Switzerland: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc.	9,462	10,571	129	West Germany 9,929; Italy 471.
Artificial:				
Corundum	7,077	7,006	250	West Germany 3,116; Austria 2,374.
Silicon carbide	4,017	1,441	(2)	West Germany 1,145; Norway 249; U.S.S.R. 30.
Dust and powder of precious and semi-precious stones including diamond kilograms	5,671	5,967	1,154	Ireland 4,002.
Grinding and polishing wheels and stones	2,171	2,065	22	West Germany 1,003; Italy 335; Austria 211.
Asbestos, crude	5,058	3,923	7	U.S.S.R. 1,422; Canada 1,408; Republic of South Africa 1,038.
Barite and witherite	1,348	885	--	West Germany 676; France 141; Italy 60.
Boron materials:				
Crude natural borates	302	200	--	Netherlands 172; Turkey 26.
Oxides and acids	402	468	1	France 165; Turkey 133; Italy 110.
Cement	350,964	425,052	16	West Germany 165,732; Italy 152,089; France 58,366.
Chalk	38,431	40,357	26	France 30,623; Italy 7,913; West Germany 1,492.
Clays, crude	179,468	171,002	1,309	United Kingdom 73,128; West Germany 72,874; France 14,456.
Cryolite and chiolite	35	16	--	Denmark 15.
Diamond:				
Gem, not set or strung value, thousands	$1,036,659	$1,480,503	$111,041	United Kingdom $1,098,280; Belgium-Luxembourg $67,365.
Industrial stones do.	$38,951	$45,587	$4,694	Ireland $36,307; West Germany $2,629.
Diatomite and other infusorial earth	6,920	6,303	123	Denmark 4,777; France 913.
Feldspar, fluorspar, related materials	17,301	11,691	--	Italy 5,209; West Germany 2,960; France 2,163.
Fertilizer materials:				
Crude, n.e.s.	17,649	14,736	1	France 9,151; Italy 3,349; West Germany 1,596.
Manufactured:				
Ammonia	22,306	28,870	--	Austria 10,535; France 9,191; West Germany 7,246.
Nitrogenous	94,564	98,083	18	Austria 33,166; West Germany 14,635; Netherlands 13,557.
Phosphatic	92,105	85,663	--	France 58,216; Belgium-Luxembourg 23,436; Netherlands 2,327.
Unspecified and mixed	164,647	169,233	14,268	France 46,131; West Germany 42,738; Belgium-Luxembourg 25,948.
Graphite, natural	108	237	(3)	West Germany 110; Italy 72; France 27.
Gypsum and plaster	70,096	69,208	--	West Germany 46,488; Italy 15,735; France 6,145.
Lime	71,824	75,295	--	West Germany 41,857; Italy 33,375.
Magnesium compounds:				
Magnesite, crude	12	24	--	NA.
Oxides and hydroxides	5,383	5,425	25	Austria 3,006; Spain 1,333.
Meerschaum, amber, jet kilograms	1	--		
Mica:				
Crude including splittings and waste	611	585	1	France 257; West Germany 159; United Kingdom 71.
Worked including agglomerated splittings	388	431	1	France 240; Belgium-Luxembourg 99; India 75.
Nitrates, crude	14	--		
Phosphates, crude	6,247	9,837	--	France 5,193; Morocco 3,977; Israel 510.
Phosphorus, elemental	4,419	4,112	83	France 1,088; Italy 1,077.
Pigments, mineral:				
Natural, crude	309	244	--	Austria 135; West Germany 77.
Iron oxides and hydroxides, processed	3,387	2,388	19	West Germany 2,107; United Kingdom 74; Japan 39.
Potassium salts, crude	81,381	71,002	--	France 48,558; West Germany 4,794.

See footnotes at end of table.

Table 3.—Switzerland: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity	1985	1986	Sources, 1986	
			United States	Other (principal)
INDUSTRIAL MINERALS —Continued				
Precious and semiprecious stones other than diamond:				
Natural value, thousands	$210,450	$255,212	$61,050	United Kingdom $32,763; Hong Kong $29,722.
Synthetic do	$8,902	$12,130	$1,77	France $5,866; West Germany $1,401.
Pyrite, unroasted	84	131		West Germany 68; France 58; Italy 5.
Salt and brine	1,932	2,226	(2)	France 1,908; West Germany 198.
Sodium compounds, n.e.s.:				
Carbonate, manufactured	5,968	4,650	(2)	East Germany 2,362; West Germany 1,958.
Sulfate, manufactured	19,166	21,527		West Germany 10,793; Austria 9,850.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	110,346	169,743		West Germany 70,981; Austria 40,663; France 30,647.
Worked	125,452	149,519	15	Italy 104,194; Portugal 19,787.
Dolomite, chiefly refractory-grade	22,410	22,885	16	Italy 11,671; West Germany 5,968; Belgium-Luxembourg 2,993.
Gravel and crushed rock	5,785,180	6,119,100	129	France 3,325,881; West Germany 1,647,340; Italy 718,732.
Limestone other than dimension	12,805	6,829		France 6,446; Italy 329; West Germany 54.
Quartz and quartzite	35,636	28,605	444	Italy 13,326; West Germany 7,952; Portugal 6,229.
Sand other than metal-bearing	1,506,443	1,693,513	21	Italy 625,114; West Germany 477,586; France 463,970.
Sulfur:				
Elemental:				
Crude including native and by-product	48,577	47,320		West Germany 47,274.
Colloidal, precipitated, sublimed	206	119	(2)	West Germany 74; France 40.
Dioxide	39	38	NA	Italy 29; France 6.
Sulfuric acid	2,846	1,609	(2)	West Germany 1,351; Austria 52; France 47.
Talc, steatite, soapstone, pyrophyllite	13,421	14,922	3	Austria 10,082; Italy 2,128; France 1,197.
Other:				
Crude	117,215	129,554	998	West Germany 71,075; Spain 23,528; France 10,577.
Slag and dross, not metal-bearing	34,998	37,304		West Germany 26,610; France 9,487.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural	1,268	1,944	53	Trinidad and Tobago 983; France 519; West Germany 383.
Carbon:				
Carbon black	5,048	5,189	92	West Germany 3,372; France 1,252.
Gas carbon	277	423		All from West Germany.
Coal:				
Anthracite and bituminous	473,541	613,799	134,406	Republic of South Africa 251,862; West Germany 77,741; Australia 54,702.
Briquets of anthracite and bituminous coal	12,473	12,327		West Germany 11,245; Belgium-Luxembourg 854.
Lignite including briquets	32,846	23,235		West Germany 21,695; East Germany 1,467.
Coke and semicoke	78,260	68,235	2,252	West Germany 41,449; France 15,707; Netherlands 5,545.
Peat including briquets and litter	61,945	64,272		West Germany 58,341; U.S.S.R. 5,403.
Petroleum:				
Crude thousand 42-gallon barrels	28,744	28,763		Libya 12,466; Nigeria 5,388; Algeria 3,938.
Refinery products:				
Liquefied petroleum gas do	12,901	11,236	(2)	Netherlands 7,177; West Germany 4,001.
Gasoline do	18,109	20,117	74	Belgium-Luxembourg 6,351; West Germany 4,085.
Mineral jelly and wax do	108	116	1	West Germany 56; France 26.
Kerosene and jet fuel do	656	641	(2)	Netherlands 195; Belgium-Luxembourg 147; Italy 136.
Distillate fuel oil do	36,902	45,074	81	U.S.S.R. 12,971; Netherlands 9,896.
Lubricants do	591	602	8	West Germany 170; Italy 122; Netherlands 104.

See footnotes at end of table.

Table 3.—Switzerland: Imports of mineral commodities[1] —Continued

(Metric tons unless otherwise specified)

Commodity		1985	1986	Sources, 1986	
				United States	Other (principal)
MINERAL FUELS AND RELATED MATERIALS —Continued					
Petroleum —Continued					
Refinery products —Continued					
Residual fuel oil					
thousand 42-gallon barrels		1,485	398		West Germany 208; Netherlands 78.
Bitumen and other residues					
	do	1,023	948		West Germany 667; Italy 191.
Bituminous mixtures	do	63	80	1	West Germany 50; France 18.
Petroleum coke	do	364	436	206	West Germany 227.

NA Not available.
[1]Table prepared by Linda Williams.
[2]Less than 1/2 unit.
[3]May include other precious metals.

COMMODITY REVIEW

METALS

Aluminum.—The Swiss aluminum and chemicals group, Alusuisse S.A., showed a profit in 1987 following a net loss in 1986. The aluminum and chemical divisions made operating profits in 1987. Alusuisse was in the middle of a major 3-year rationalization program that called for reducing its primary aluminum smelting capacity with all smelting in the future to be done at its European facilities. Plans called for reducing primary smelting capacity in 1988 to between 250,000 to 300,000 tons per year after having reduced primary smelting capacity in 1986 by 50% from 800,000 to 400,000 tons per year.

In the United States, changes in Alusuisse operations included the sale of the Ormet smelter, the Burnside alumina works, and the Madison extrusion works and the shutdown of the New Johnsonville smelter. Also, plans called for Alusuisse to close the Chippis smelter in Switzerland and to reduce production at its Rheinfelden smelter in the Federal Republic of Germany to 40,000 tons per year.

These moves would make it necessary for Alusuisse to buy 30% to 40% of its metal from outside; the company had already started the process of evaluating sources of billet and slab. The highest quality metal was to be produced in-house, with the brought-in metal used for the less exacting product lines.

Although Alusuisse had sold part of its share in Sor-Norge Aluminium A/S in Norway and was negotiating the sale of one-half of its share in Sava-Alumino Veneto in Italy, it did not plan to completely eliminate its European smelting capacity. Alusuisse planned to reduce its emphasis on primary metal and to sell part of its alumina and bauxite operations.

Future development at Alusuisse envisioned continuing development of downstream products with high-quality, value-added products as its target. Alusuisse planned to particularly concentrate on packaging, and also to concentrate on extrusions for the transport sector, on lithographic sheet, and on casting alloys. Alusuisse was already an international supplier of wide extrusions to railroad coach builders, and in the extrusion sector, plans called for increasing throughput of hard alloys and moving away from more general application soft alloys.

One of the major plants where Alusuisse planned to produce higher quality products was its Singen plant in the Federal Republic of Germany. The plant contained an array of rolling, extruding, lacquering, and foil converting equipment, including an extrusion press capable of producing 800-millimeter extrusions, which were the widest produced in Europe. Owing to its high-quality output, Alusuisse planned to market products from Singen in Europe and North America.

Gallium.—Alcan Aluminum Ltd., which operated a 10-ton-per-year gallium plant at Rorschach that it purchased from Alusuisse in 1985, was producing gallium from 99.9999% (6N) to 99.999999% (8N) purity using 99.9% (3N) to 99.99% (4N) pure gal-

lium recovered from scrap feed material from the company's plant in Canada. In recent years, most of Switzerland's gallium production was exported to the United States with a small quantity exported to Japan.

Alcan was testing a pilot gallium extraction plant at its Jonquire, Quebec, Canada, aluminum smelter in an effort to get a 4-ton-per-year extraction unit on-stream to produce comparatively low-grade 4N metal for shipment to Rorschach for refining into 99.99999% (7N) and 8N gallium metal. Ultimate capacity at the Jonquire plant was envisioned at 15 tons per year.

Also, regarding new gallium production facilities, Sulzer, the Swiss engineering firm, was constructing a pilot gallium extraction plant at Kaiser Aluminum's Gramercy, Louisiana, alumina refinery.

Gold.—Exploration of the Disentis Prospect in Graubunden Canton, continued. Approximately 1,200 meters of holes had been drilled, and electromagnetic and magnetic surveys were conducted by helicopter. Reportedly, detailed geological mapping and prospecting of geological anomalies had occurred. Previous sampling of the area yielded grab samples assaying in a range from 11 meters deep at 2.4 grams per ton to 0.33 meter deep at 8.6 grams per ton.

Iron and Steel.—The Swiss steelmaker, Von Roll Ltd., reported its profits rose 31% in 1987 despite a 1% decrease in turnover. Von Roll was helped by a strong demand for reinforcing bar (rebars) from the construction industry. Nevertheless, Von Roll planned to reduce steel capacity by 100,000 tons per year at its Gerlafinger and Monteforno works.

INDUSTRIAL MINERALS

The building trades traditionally occupied a strong place in the Swiss economy. Building and construction accounted for more than 15% of the gross national product (GNP), ranking Switzerland second only to Japan in the share of the GNP accounted for by this sector among advanced industrial nations.

Cement.—In 1987, portland cement production increased 5% over 1986. Almost 59% of the cement consumed went into the ready-mixed concrete industry, 16% went to the building trades, 10% went to concrete products manufacturers, and the remainder to miscellaneous uses. Plans called for commissioning the first desulfurization plant in the Swiss cement industry during the first half of 1988 with Switzerland's Holderbank Management and Consulting Ltd. installing the data handling system.

Sodium Compounds.—The Swiss plant, La Soudiere Swisse, a subsidiary of Belgium's Salvay and Cie. S.A., ceased production of sodium carbonate in mid-1987. The plant had a capacity of about 50,000 tons per year of sodium carbonate.

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[1]Foreign mineral specialist, Division of International Minerals.

[2]Where necessary values have been converted from Swiss francs (SWF) to U.S. dollars at the rate of SWF1.49=US$1.00.

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